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Extent of damage by *Spodoptera litura* on cabbage

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Abstract

Field experiment was conducted to determine the extent of damage by *Spodoptera litura* on cabbage, in Jabalpur, Madhya Pradesh during the *Rabi* season from Sept., 2017 to March, 2018 at two different locations. The extent of damage by *S. litura* was recorded with respect to infestation done by larval population. The infestation started on cabbage in second fortnight of November. During the period, average larval population was 0.1 larvae/head which caused 2 per cent of plant infestation. During second fortnight of January, maximum head infestation (54 %) was recorded by average larval population 3.17 larvae/head.

Keywords: Extent of damage, cabbage, *Spodoptera litura*, tobacco caterpillar

Introduction

Cabbage is an important cole crop grown as winter vegetable in India. China is the major cabbage producing country with 47 percent of world production followed by India (12%) [10]. In India, the area under cabbage cultivation is around 3.99 lakh hectare with 90.37 lakh tones production and average yield of 22.7 T/ha during 2017-18. Madhya Pradesh is a major cabbage producing states in India accounts for 7.0 percent of the total production of cabbage in the country [2].

Major constrains of cabbage cultivation is insect pest complex infesting it from germination till harvesting. Among these insect pests, tobacco caterpillar, *Spodoptera litura* F. (Noctuidae: Lepidoptera) is a most important pests causing severe yield loss to cabbage every year. *Spodoptera litura* is a polyphagous pest and has been reported on about 112 cultivated plants. *S. litura* may cause an economic loss ranged from 25.8 - 100% [5].

Material and Methods

Studies on extent of damage by *Spodoptera litura* on cabbage were conducted during the *Rabi* season from September, 2017 to March, 2018 at two different locations namely, Gohalpur and Maharajpur within a radius of 10 km from college of Agriculture, JNKVV, Jabalpur. Experiment was conducted on cabbage variety CABHYB-1 with spacing 60cm × 50cm (Row × plant) and with plot size 10m × 40m.

Visual observations recorded to determine the percentage of infestation and extent of damage of cabbage due to *S. litura*. Observations were taken from twenty-five heads at fortnightly interval for the estimation of Average larval population of *Spodoptera litura* per head. Fifty heads were observed for per cent head infestation on the basis of different criteria as low, moderate and high infestation (plate 1). The extent of damage was based on the percentage infestation of heads at different larval population.

Percent plant infestation:

$$1. \text{ Damaged head per cent} = \frac{\text{No.of infested plant}}{\text{Total No.of plants}} \times 100$$

$$2. \text{ Yield loss per cent} = \frac{\text{damaged head yield}}{\text{Total yield}} \times 100$$

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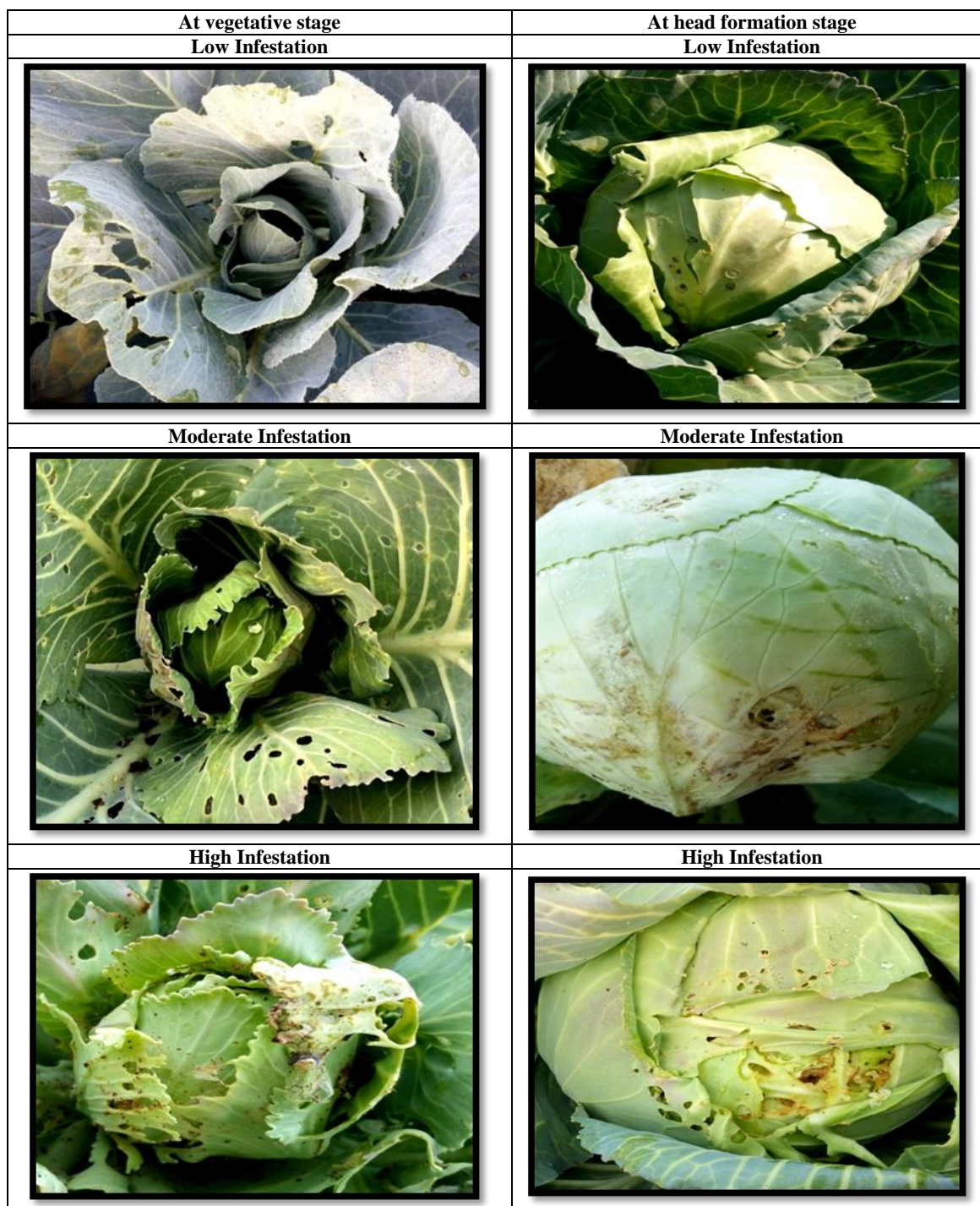


Plate 1: Criteria taken for visual observation of extent of damage on different plant stages of cabbage crop

Result

The present investigation has been undertaken to study the extent of damage on cabbage caused by *S. litura*. The first infestation by tobacco caterpillar *S. litura* was recorded in the second fortnight of November with average larval population 0.1 larvae/head with 2 per cent plant infestation (Fig. 2). Maximum 54 per cent plant infestation was recorded during second fortnight of January with the larval population 3.17 larvae/head, out of which 24, 10 and 20 per cent plants were moderately, less and highly infested respectively (Fig 1). First fortnight of February witnessed a decline in larval population as well as per cent infestation of

cabbage (Fig. 2). At that time the larval population was 2.70 larvae/head with 26 per cent plant infestation. Infested plants were 12, 8 and 6 per cent less, moderate and highly damaged respectively (Fig. 1). In second fortnight of February average per cent plant infestation was decreased abruptly to 22 per cent with 14 per cent less, 6 per cent moderate and 2 per cent highly damaged with larval population 2.65 larvae/head. In first fortnight of March average larval population was 2.26 larvae/head and plant infestation was 20 per cent, only moderate and less infested plants were found in that period (Fig. 1, 2, 3).

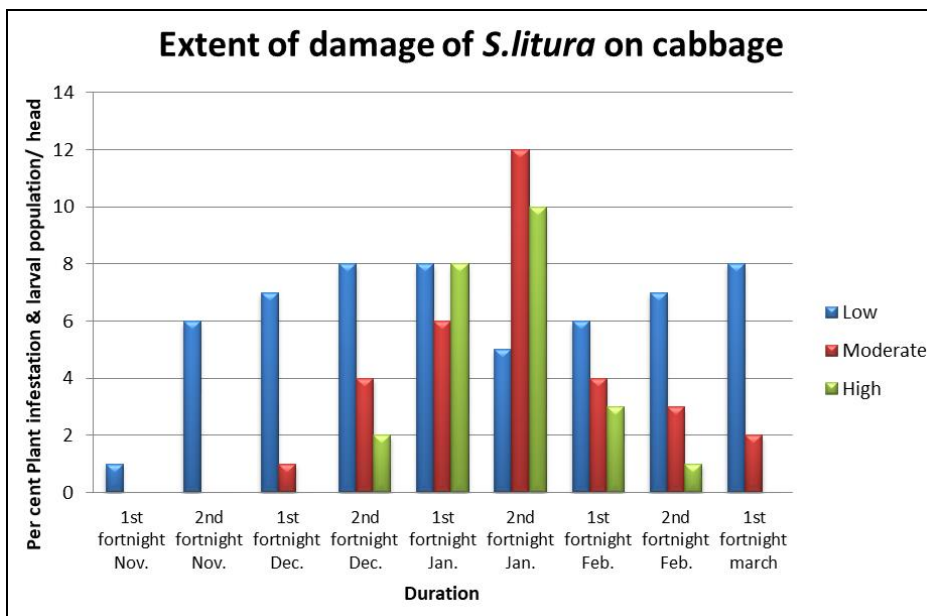


Fig 1: Percent plant infestation of *S. litura* on cabbage at fortnightly interval

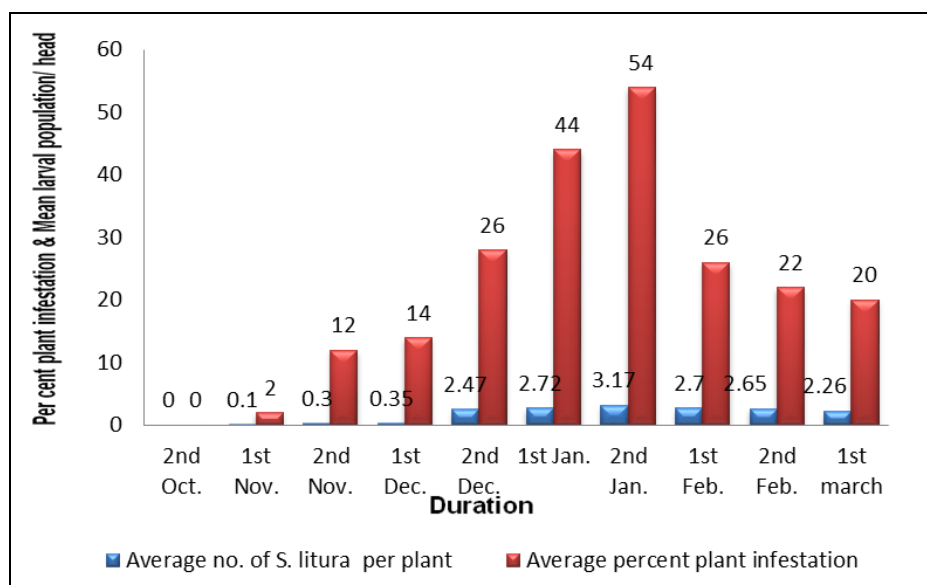


Fig 2: Percent plant infestation & larval population / head at fortnightly interval

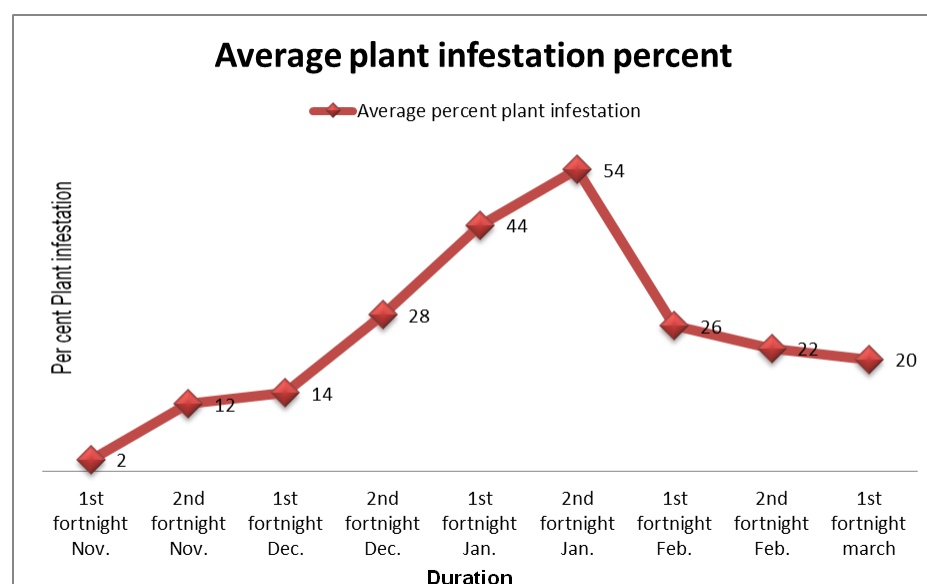


Fig 3: Average plant infestation by *S. litura* on cabbage during crop season

Activity period of *S. litura* was recorded when the crop age was about 47 days' *i.e.* First week of November to till harvesting of the crop. The *S. litura* incidence, however was found maximum (3.15 larvae/plant) during the third week of January with A maximum of 54 per cent plant infestation. This finding is in accordance with that of Ali and Bakshi (1994) ^[1] reported that *S. litura* was present in a December-planted cabbage crop during January-March. Damage was highest in early February and there was a positive correlation between plant damage and pest density. This supports the finding of the present investigation.

Similar findings have been reported by Khuhro *et al.* (1987) and Ali and Bakshi (1994) ^[1] and Maree *et al.* (1999) ^[8] and Badjena and Mandal (2005) ^[3] they also have reported the incidence of *S. litura* on cabbage which are more or less in accordance with the finding of the present investigation. Chari *et al.*, (1994) ^[4], Sarkar (1995), Hussain (2001) ^[6] and Rao and Sitaramaiah (2001) ^[9] have also reported the extent of damage by *S. litura* on cabbage from 10 to up to 100%. These support the finding of the present investigation.

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